UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/659,597	09/11/2000	Oscar Chi-Lim Au	016660-039	4795

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EXAMINER
LEE, RICHARD J

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 02/17/2004   *10*

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.		**Applicant(s)**
Office Action Summary	09/659,597		AU ET AL.
	Examiner		**Art Unit**
	Richard Lee		2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .
2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,13,15,24,26,35,37,39 and 40* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *12,13,15,24,26,35,37,39 and 40* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____ .
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____ .

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____ .

1.   Claims 12, 13, 15, 24, 26, 35, 37, 39, and 40 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention.

For examples:

> (1) claim 12, line11, "said successive pixel" shows no clear antecedent basis;

> (2) claim 13, line 3, "the image" should be changed to "the first image" in order to

provide proper antecedent basis for the same as specified at claim 12, lines 1-2;

> (3) claim 13, lines 3-4, "the image" should be changed to "the first image" in order to

provide proper antecedent basis for the same as specified at claim 12, lines 1-2; and

> (4) claim 15, line 11, "said successive pixel" shows no clear antecedent basis.

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 12, 13, 15, 24, 26, 35, 37, 39, and 40 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Jung of record (5,717,470) in view of Moriyoshi of record (6,549,576).

Jung discloses a method and apparatus for detecting optimum motion vectors based on a

hierarchical motion estimation approach as shown in 1-3, and substantially the same method as

claimed in claims 12, 13, 15, 24, 26, 35, 37, 39, and 40 of selecting, for a first block of a first

image based on an array of pixels, a similar block of a second image based on the array of pixels

(see column 4, lines 11-28), the method including defining a reference pixel of the array (i.e., the

candidate blocks comprises reference pixels, see column 4, lines 11-28), the reference pixel is

defined based on an estimated motion vector associated with the first block (see column 4, lines

11-28); deriving at least one threshold value (see column 4, line 66 to column 5, line 17);

defining a plurality of search zones in the array, labelled by integer index i, the zones

surrounding the reference pixel and having a radius which increases for increasing i (see Figure 3

and column 4, line 34 to column 5, line 17); after the threshold value deriving step, for

successive zones, and for successive pixels in each zone, determining a block of the second

image based on each of the successive pixel, and determining a mismatch value between the first

block of the first image and the determined block based on a mismatch criterion, and selecting

the similar block of the second image as the determined block for which the determined

mismatch is lowest, wherein the determining steps is terminated upon at least one termination

criterion being satisfied, the termination criterion being defined in terms of a respective threshold

value (see Figure 3, column 2, line 49 to column 3, line 55, column 4, line 34 to column 5, line

7); a method of encoding a first image which includes defining successive blocks of the first

image, and for each block of the first image selecting a similar block of a second image, and

encoding the block of the first image as data specifying the similar block of the second image,

and the data specifying differences between the block of the first image and the similar block of

the second image (see column 1, line 31 to column 2, line 14); and computer readable medium

storing computer executable program code, whereby execution of the code by a processor causes

the processor to select a block of the second image (see column 1, line 31 to column 2, line 14);

defining successive blocks of the first image, and for each block of the first image selecting a

similar block of a second image, encoding the block of the first image as data specifying the

similar block of the second image, and the data specifying differences between the block of the

first image and the similar block of the second image (see column 1, line 31 to column 2, line

14); and prior to the step of defining a plurality of search zones, deriving a zone number M, and

in the step of defining a plurality of search zones, the number of the search zones is M (see

Figure 3 and column 4, line 34 to column 5, line 17).

Jung does not particularly disclose, though, in which in the deriving step, the at least one

threshold value is determined based on a previously derived minimum mismatch value for at

least one further block of the first image adjacent the first block of the first image, and deriving

at least one threshold value based on a mismatch value of a second block of the first image

adjacent the first block as claimed in claims 12, 13, and 15. However, Moriyoshi discloses a

motion vector detecting method and apparatus as shown in Figure 1, and teaches the

conventional threshold value determination based on a previously derived minimum mismatch

value for at least one further block of the first image adjacent the first block of the first image

and deriving at least one threshold value based on a mismatch value of a second block of the first

image adjacent the first block (see column 2, line 40 to column 3, line 32). Therefore, it would

have been obvious to one of ordinary skill in the art, having the Jung and Moriyoshi references in

front of him/her and the general knowledge of threshold value settings within video motion

estimation systems, would have had no difficulty in providing the threshold value determination

based on a previously derived minimum mismatch value for at least one further block of the first

image adjacent the first block of the first image and deriving at least one threshold value based

on a mismatch value of a second block of the first image adjacent the first block all as part of the

motion estimation within Jung for the same well known motion vector detecting within motion estimation systems purposes as claimed.

4.   Regarding the applicants' arguments at pages 10-12 of the amendment filed December 4, 2003 concerning in general that "... There is no discussion of how To is derived, except for the rather vague reference at column 7, lines 20-25 ... In other words, it has nothing to do with a threshold derived based on a mismatch, as recited in claims 12 and 15. Even if it is based on a mismatch, a comparison of To is only sufficient to terminate a search for the reference point itself, not for a "plurality of zones" as recited in step (iii) of each claim ... Jung's method is based on the concept of varying the threshold during the searching operation ... the threshold applied in Moriyoshi is used in a completely different way from that of Jung, and for a different purpose. In Moriyoshi the threshold is used to abort the calculation of mismatch for a given block ... In the passage describing the setting of the threshold (col. 3, lines 22-32), the threshold is clearly continually being reset, and this is during the searching based on the search area ... The feature of varying the threshold during the scanning of a search (i.e., what is taught in Jung and Moriyoshi) teaches against the present invention as defined in both claims 12 and 15 ...", the Examiner respectfully disagrees. The Examiner wants to point out that both Jung and Moriyoshi deal with the particular setting of threshold values for comparison to the calculated differences between the current block and blocks in the search range in order to determine the best matched block for the current block. Though Jung and Moriyoshi may provide different features in their respective motion estimation systems, the Examiner disagrees with the applicants that the threshold settings in Jung are for a different purpose from Moriyoshi and it is further submitted that it does not however show nonobviousness to combine the references. Moriyoshi

nevertheless teaches the conventional block matching techniques involving the calculation of

residual differences between blocks in each position within a search range and blocks of the

current image (see column 2, lines 40-46), and the comparison of the calculated residual

differences to a set threshold value whenever the calculations of the residual difference are

performed until the end of the block without aborting on the way (see column 3, lines 17-32). At

column 3, lines 22-32, Moriyoshi clearly teaches that the minimum value of the past residual

difference is set as the threshold value, and with the calculated residual being set to the first

threshold value and subsequently the calculated residual difference is set to the new threshold

value whenever calculations of the residual difference are performed until the end of the block.

As such, it is submitted that such derivation of the threshold value within Moriyoshi is based on

a previously derived mismatch value for at least one further block of the first image adjacent the

first block of the first image, and based on a mismatch value of a second block of the first image

adjacent the first block(i.e., block matching techniques involving the calculation of residual

differences between blocks in each position within a search range and blocks of the current

image (see column 2, lines 40-46 of Moriyoshi)). And it is further submitted again that one

skilled in the art would certainly have no difficulty in providing such specific threshold value

derivations of Moriyoshi as part of the motion estimation within Jung for the same well known

motion vector detecting within motion estimation systems purposes as claimed.

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

6.   Any response to this final action should be mailed to:

> Box AF
>> Commissioner of Patents and Trademarks
>> Washington, D.C. 20231

> or faxed to:

>> (703) 872-9314, (for formal communications; please mark "EXPEDITED
>> PROCEDURE") (for informal or draft communications, please label
>> "PROPOSED" or "DRAFT")

> Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal
> Drive, Arlington. VA., Sixth Floor (Receptionist).

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Lee whose telephone number is (703) 308-6612. The Examiner can normally be reached on Monday to Friday from 8:00 a.m. to 5:30 p.m, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group customer service whose telephone number is (703) 306-0377.

RICHARD LEE
PRIMARY EXAMINER

Richard Lee/rl

2/12/04